IN THE CLAIMS

Please amend claims 1, 8, and 15 as follows:

1. (CURRENTLY AMENDED) A holographic filter comprising multiple superpositioned holograms within a volume holographic medium wherein:

the multiple superpositioned holograms synthesize a filter shape with multiple peaks at specified positions;

the filter shape precisely matches a spectrum of a substance; and

the holographic filter is ~~capable of being~~ used to detect the substance by allowing the spectrum matching the multiple peaks to pass through the filter simultaneously onto a detector.

2. (ORIGINAL) The holographic filter of claim 1, wherein the multiple peaks have specified relative strengths and widths.

3. (ORIGINAL) The holographic filter of claim 1, wherein the holographic filter is capable of detecting the substance by simultaneously detecting the multiple peaks of the spectrum of the substance.

4. (ORIGINAL) The holographic filter of claim 1, wherein the multiple superpositioned holograms are recorded using multiple pairs of reference beams that are introduced in the volume holographic medium simultaneously.

5. (ORIGINAL) The holographic filter of claim 1, wherein the multiple superpositioned holograms are recorded using multiple pairs of reference beams that are introduced in the volume holographic medium sequentially.

6. (ORIGINAL) The holographic filter of claim 5, wherein:

the sequential introduction provides a desired spectral filtering function for the spectrum of the substance;

the spectrum of the substance is broken into a sequence of peaks of varying amplitude and width; and

a separate grating is recorded in the volume holographic medium for each of the peaks.

7. (ORIGINAL) The holographic filter of claim 1, further comprising a spectroscopy apparatus configured to use the holographic filter to detect the substance.

8. (CURRENTLY AMENDED) A method for filtering a spectra comprising:

determining a spectrum of a substance;

recording multiple superpositioned holograms within a volume holographic medium to synthesize a filter shape with multiple peaks at specified positions that precisely matches the spectrum of the substance; and

detecting the substance using the volume holographic medium as a filter by allowing the spectrum matching the multiple peaks to pass through the filter simultaneously onto a detector.

9. (ORIGINAL) The method of claim 8, wherein the multiple peaks have specified relative strengths and widths.

10. (ORIGINAL) The method of claim 8, wherein the detecting step comprises simultaneously detecting the multiple peaks of the spectrum of the substance.

11. (ORIGINAL) The method of claim 8, wherein the recording step comprises simultaneously introducing multiple pairs of reference beams in the volume holographic medium.

12. (ORIGINAL) The method of claim 8, wherein the recording step comprises sequentially introducing multiple pairs of reference beams in the volume holographic medium.

13. (ORIGINAL) The method of claim 12, wherein the sequentially introducing comprises:

providing a desired spectral filtering function for the spectrum of the substance;

breaking upon the spectrum of the substance into a sequence of peaks of varying amplitude and width; and

recording a separate grating in the volume holographic medium for each of the peaks.

14. (ORIGINAL) The method of claim 8, wherein the volume holographic medium is used as a filter in a spectroscopy apparatus.

15. (CURRENTLY AMENDED) An apparatus for filtering a spectra comprising:

means for determining a spectrum of a substance;

means for recording multiple superpositioned holograms within a volume holographic medium to synthesize a filter shape with multiple peaks at specified positions that precisely matches the spectrum of the substance; and

means for detecting the substance using the volume holographic medium as a filter by allowing the spectrum matching the multiple peaks to pass through the filter simultaneously onto a detector.

16. (ORIGINAL) The apparatus of claim 15, wherein the multiple peaks have specified relative strengths and widths.

17. (ORIGINAL) The apparatus of claim 15, wherein the means for detecting comprises means for simultaneously detecting the multiple peaks of the spectrum of the substance.

18. (ORIGINAL) The apparatus of claim 15, wherein the means for recording comprises means for simultaneously introducing multiple pairs of reference beams in the volume holographic medium.

19. (ORIGINAL) The apparatus of claim 15, wherein the means for recording comprises means for sequentially introducing multiple pairs of reference beams in the volume holographic medium.

20. (ORIGINAL) The apparatus of claim 19, wherein the means for sequentially introducing comprises:

means for providing a desired spectral filtering function for the spectrum of the substance;

means for breaking upon the spectrum of the substance into a sequence of peaks of varying amplitude and width; and

means for recording a separate grating in the volume holographic medium for each of the peaks.

21. (ORIGINAL) The apparatus of claim 15, wherein the volume holographic medium is used as a filter in a spectroscopy apparatus.